

AMENDMENT TO DRAWINGS

Two Replacement Sheets of drawings are attached as part of the Appendix includes changes to Figures 1 – 3. These sheets, which includes Figures 1 – 3, replace the original sheets including Figures 1 – 3. In particular, Figure 1 – 3 have been amended to include the legend “Prior Art” to address an objection by the Examiner.

REMARKS***Summary of the Amendment***

Upon entry of the above amendment, two Replacement Sheets of drawings, which include amended Figures 1 – 3, will replace the original sheets of drawings. Moreover, claims 1 – 30 will remain pending.

Summary of the Official Action

In the instant Office Action, the Examiner has objected to the drawings and rejected the claims over the art of record. By the present amendment and remarks, Applicants submit that the objections and rejections have been overcome, and respectfully request reconsideration of the outstanding Office Action and allowance of the present application.

Submission of Replacement Sheets

Concurrently herewith, Applicants are submitting 2 Replacement Sheets in which Figures 1 – 3 have been identified as “Prior Art” in accordance with the Examiner’s instructions.

Accordingly, entry of these replacement sheets and withdrawal of the drawing objection is requested.

Traversal of Drawing Objection

Applicants traverse the objection to the drawings under 37 C.F.R. 1.83(a), in the Examiner asserts that further illustration is necessary to show the features of claims 8 – 11 and 14.

In particular, Applicants note that claims 8 and 9 are directed to the light source, which is illustrated in the figures. While the specific laser and lens are not illustrated,

Applicants submit that one ordinarily skilled in the art would readily understand and be able to utilize and laser and lens for the light source illustrated in Figure 4, such that no further illustration is necessary.

Moreover, with regard to claim 10, Applicants submit that one ordinarily skilled in the art reviewing the instant specification would readily understand the invention, including the positioning the lens in the beam path in front of the sensor, as recited in claim 10.

With regard to claims 11 and 12, Applicants submit that the use of mirrors to fold or bend light beams in order to reduce space is well known in the art, such that one ordinarily skilled in the art would not require further illustration to readily understand the invention recited in claims 11 and 12.

Accordingly, Applicants submit that no further drawings are necessary to facilitate the understanding of the invention by those ordinarily skilled in art. Therefore, Applicants request that the Examiner reconsider and withdraw the objection to the drawings under 37 C.F.R. 1.83(a) and indicate that the drawings are acceptable.

Traversal of Rejection Under 35 U.S.C. §103(a)

1. *Over Kohno in view of PAPI*

Applicants traverse the rejection of claims 1 – 7 and 10 – 30 under 35 U.S.C. §103(a) as being unpatentable over KOHNO (U.S. Patent No. 4,705,940) in view of the prior art of the present invention (Figures 1 – 3) [hereinafter “PAPI”]. The Examiner asserts that, except for an image sensor, KOHNO shows all of the recited features of the invention. Moreover, the Examiner asserts that, as PAPI discloses a CCD camera to capture a reflected image, it would have been obvious to modify KOHNO to include

such a device. Applicants traverse the Examiner's assertions.

Applicants' independent claim 1 recites, *inter alia*, a *collimating concave mirror* structured and arranged *to produce a parallel beam* and to direct the parallel beam to a sample to be investigated, a structured mask located between said light source and said concave mirror, and an image sensor structured and arranged to receive a beam reflected from the sample and said concave mirror, wherein relative positions of said mask and said sensor to other elements of the apparatus are chosen to provide an essentially sharp image of the mask on the sensor. Further, Applicants' independent claim 23 recites, *inter alia*, directing light through a structured mask onto a concave mirror, directing *collimated light to a sample* to be investigated, receiving a beam reflected from the sample and the concave mirror, and positioning the mask and the sensor in relation to the mirror and the sample to provide an essentially sharp image of the mask on the sensor. Applicants submit that no proper modification of KOHNO teaches or suggests at least the above-noted features of the invention.

Applicants note that, while KOHNO shows light from a source incident upon a curved mirror, KOHNO neither teaches nor suggests that the light from the curved mirror is a parallel beam or collimated beam to be directed at the sample. In fact, it is apparent from the figures of KOHNO that the beam converges to a single point on the workpiece, and there is no suggestion of any parallel beams formed and/or utilized by KOHNO, as recited in at least independent claims 1 and 23.

Moreover, Applicants note that with regard to Figures 1 – 3 of the PAPI, only Figure 1 arguably discloses a parallel or collimated beam. However, this beam is utilized to determine a profile of a surface, not to project an image onto a workpiece, as

performed by KOHNO. Thus, Applicants submit that, notwithstanding that PAPI discloses using parallel or collimated beam, the art of record fails to provide any teaching or suggestion for using such a beam in combination with KOHNO that would render obvious the Examiner's asserted combination.

As KOHNO and Figure 1 of PAPI utilize light beams for wholly distinct purposes, Applicants submit that the art of record fails to provide the requisite motivation or rationale for combining these documents in manner asserted by the Examiner. In fact, Applicants submit that the only rationale for modifying the documents in the manner asserted by the Examiner is found in Applicants' own disclosure, which is an impermissible use of hindsight.

Accordingly, Applicants submit that claims 1 and 23 are allowable over the art of record.

Further, Applicants submit that claims 2 – 7, 10 – 22, and 24 – 30 are allowable at least for the reason that these claims depend from allowable base claims and because these claims recite additional features that further define the present invention. In particular, Applicants submit that no proper combination of KOHNO and PAPI teaches or suggests, *inter alia*, the samples comprise semiconductor wafers and other mirror-like surfaces, as recited in claim 2; said light source comprises substantially a point source, as recited in claim 3; said concave mirror comprises an off-axis parabolic mirror, as recited in claim 4; said structured mask comprises a quadratic grid, as recited in claim 5; said image sensor comprises a CCD image sensor, as recited in claim 6; a converging lens positioned in front of said light source to be in a beam path, as recited in claim 7; one of a converging and a diverging lens positioned in front of said sensor to

be in a beam path, as recited in claim 10; at least one flat mirror is positioned between said light source and said concave mirror to fold an optical path, as recited in claim 11; at least one of said at least one mirror comprises a partially transmitting mirror, as recited in claim 12; at least one of the at least one mirror is a semi-transparent mirror, as recited in claim 13; at least one flat mirror is positioned between the sample and said concave mirror to fold an optical path, as recited in claim 14; at least one of said at least one mirror comprises a partially transmitting mirror, as recited in claim 15; at least one of said at least one mirror comprises a semi-transparent mirror, as recited in claim 16; at least one flat mirror is positioned between said sensor and said concave mirror to fold an optical path, as recited in claim 17; at least one of said at least one mirror comprises a partially transmitting mirror, as recited in claim 18; at least one of said at least one mirror comprises a semi-transparent mirror, as recited in claim 19; a computer coupled to said sensor, said computer comprising an algorithm to calculate a height of a given point of the sample from a position of an image point on said sensor, as recited in claim 20; a process for fast, quantitative, non-contact topographic investigation of a sample in the apparatus, as recited in claim 21; calculating the height of a given point of the sample from a position of an image point on the sensor, as recited in claim 22; the samples comprise semiconductor wafers and other mirror-like surfaces, as recited in claim 24; a light source is arranged to produce light, as recited in claim 25; the concave mirror comprises an off-axis parabolic mirror, as recited in claim 26; the structured mask comprises a quadratic grid, as recited in claim 27; the image sensor comprises a CCD image sensor, as recited in claim 28; converging the beam before the mask, as recited in claim 29; and folding an optical path between the sample and the mirror, as recited in

claim 30.

Accordingly, Applicants request that the Examiner reconsider and withdraw the rejection of claims 1 – 7 and 10 – 30 under 35 U.S.C. §103(a) and indicate that these claims are allowable.

2. Over Kohno in view of PAPI and further in view of Kubota

Applicants traverse the rejection of claims 8 and 9 under 35 U.S.C. §103(a) as being unpatentable over KOHNO in view of PAPI and further in view of KUBOTA et al. (U.S. Patent No. 5,969,581) [hereinafter “KUBOTA”]. While acknowledging that KOHNO and PAPI fail to teach or suggest a laser light source and converging lens, the Examiner asserts that, in view of the disclosure of KUBOTA, it would have been obvious to modify the asserted combination of KOHNO and PAPI to include such a light source.

Applicants note that, like KOHNO, KUBOTA discloses a device structured and arranged to focus a point of light onto a workpiece. Thus, like KOHNO, KUBOTA fails to provide any teaching or suggestion of forming and/or directing a parallel or collimated beam onto a sample, as recited in at least independent claims 1 and 23.

Thus, Applicants submit that the additional teaching of KUBOTA fails to cure the above-noted defect in the previous rejection of at least independent claims 1 and 23 over KOHNO in view of PAPI, i.e., the art of record (including KUBOTA) fails to provide the requisite motivation or rationale for modifying KOHNO in any manner that would arguably render unpatentable the combination of features recited in at least independent claims 1 and 23. That is, as both KOHNO and KUBOTA disclose forming a point of light, there is no teaching or suggestion for forming and using parallel or

collimated beams, such that the art of record fails to suggest any obvious combination of PAPI with the teachings of KOHNO and KUBOTA.

Thus, Applicants submit that independent claims 1 and 23 are allowable over any proper combination of KOHNO in view of PAPI and KUBOTA.

Further, Applicants submit that claims 2 – 7, 10 – 22, and 24 – 30 are allowable at least for the reason that these claims depend from allowable base claims and because these claims recite additional features that further define the present invention. In particular, Applicants submit that no proper combination of KOHNO in view of PAPI and KUBOTA teaches or suggests, *inter alia*, said light source comprises a laser and a converging lens structured and arranged to provide a diverging beam, as recited in claim 8; and said light source comprises a laser with a built-in converging lens that is structured to provide a diverging beam, as recited in claim 9.

Accordingly, Applicants request that the Examiner reconsider and withdraw the rejection of claims 8 and 9 under 35 U.S.C. §103(a) and indicate that these claims are allowable.

Application is Allowable

Thus, Applicants respectfully submit that each and every pending claim of the present invention meets the requirements for patentability under 35 U.S.C. §§ 102 and 103, and respectfully request the Examiner to indicate allowance of each and every pending claim of the present invention.

Authorization to Charge Deposit Account

The undersigned authorizes the charging of any necessary fees, including any extensions of time fees required to place the application in condition for allowance by

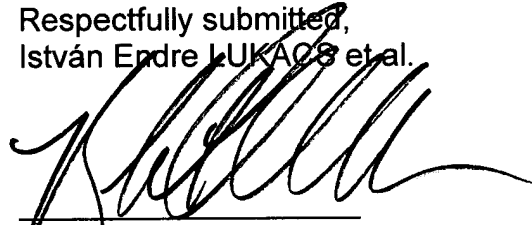
Examiner's Amendment, to Deposit Account No. 19 - 0089 in order to maintain pendency of this application.

CONCLUSION

In view of the foregoing, it is submitted that none of the references of record, either taken alone or in any proper combination thereof, anticipate or render obvious the Applicants' invention, as recited in each of claims 1 – 30. The applied references of record have been discussed and distinguished, while significant claimed features of the present invention have been pointed out.

Accordingly, reconsideration of the outstanding Office Action and allowance of the present application and all the claims therein are respectfully requested and now believed to be appropriate.

Respectfully submitted,
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